Small Business Innovation Research/Small Business Tech Transfer

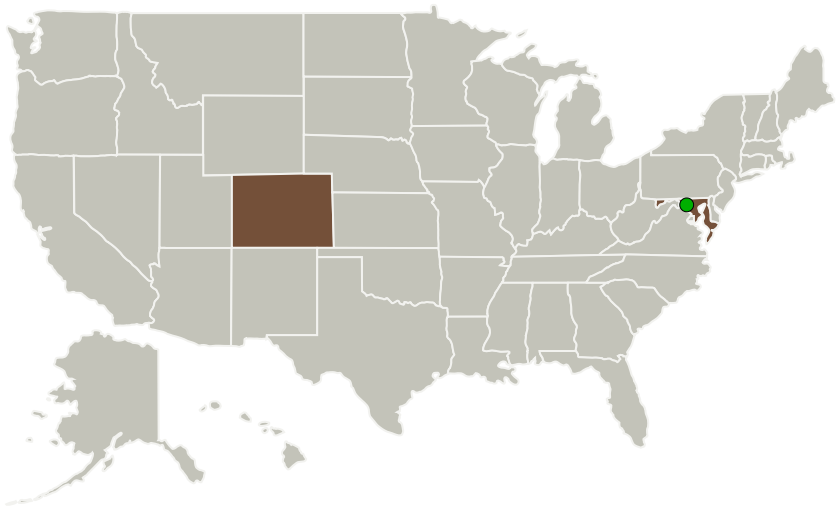
Electric Potential and Field Instrument for CubeSat (EPIC), Phase I

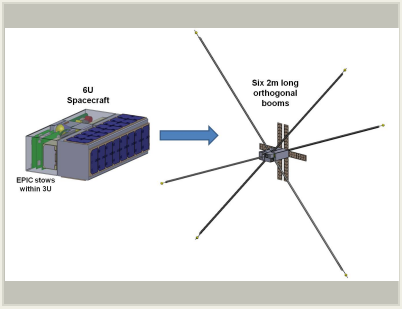
Completed Technology Project (2015 - 2015)

Project Introduction

Upcoming NASA Earth and Space Science missions as well as planetary exploration missions will require improvements in particle and field sensors and associated instrument technologies. Technology developments are needed that result in expanded measurement capabilities and a reduction in size, mass, power, and cost. To that end, NASA has become increasingly interested in the use of small spacecraft platforms such as CubeSats. Many of the sensors required for measurement of an electric field are extremely sensitive to fields created by the spacecraft electronics and therefore must be positioned on orbit at a significant distance from the spacecraft. This presents major challenges for the accommodation of this type of instrument on a CubeSat platform. In particular, several miniaturized booms must be stowed in a very small volume for launch and must have sufficient deployed properties to allow for high pointing accuracy, adequate deployed stiffness and thermal stability on orbit. In the proposed effort, Composite Technology Development, Inc. (CTD) and the Laboratory for Atmospheric and Space Physics (LASP) will collaborate to provide an electric field instrument containing miniaturized sensor electronics and thermally stable, compactly stowed and structurally rigid graphite composite booms to measure electric fields effectively on a low-cost CubeSat platform.

Primary U.S. Work Locations and Key Partners





Electric Potential and Field Instrument for CubeSat (EPIC), Phase I

Table of Contents

Small Business Innovation Research/Small Business Tech Transfer

Electric Potential and Field Instrument for CubeSat (EPIC), Phase I

Completed Technology Project (2015 - 2015)

Organizations Performing Work	Role	Type	Location
Composite Technology Development, Inc.	Lead Organization	Industry	Lafayette, Colorado
Goddard Space Flight Center(GSFC)	Supporting Organization	NASA Center	Greenbelt, Maryland

Primary U.S. Work Locations	
Colorado	Maryland

Project Transitions

June 2015: Project Start

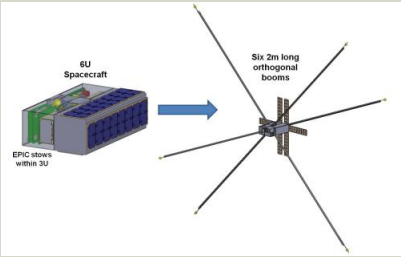
December 2015: Closed out

Closeout Summary: Electric Potential and Field Instrument for CubeSat (EPIC), Phase I Project Image

Closeout Documentation:

- Final Summary Chart Image*(https://techport.nasa.gov/file/138827)*

Images



Briefing Chart Image
Electric Potential and Field Instrument for CubeSat (EPIC), Phase I
(https://techport.nasa.gov/image/127116)

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
Composite Technology Development, Inc.

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

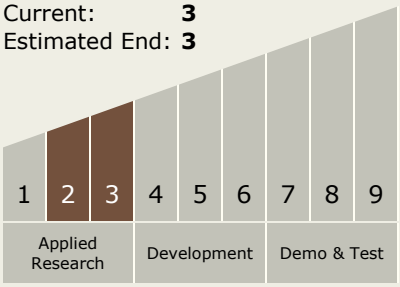
Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Dana Turse

Technology Maturity (TRL)

Start: **2**
Current: **3**
Estimated End: **3**



Electric Potential and Field Instrument for CubeSat (EPIC), Phase I

Completed Technology Project (2015 - 2015)

Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.4 Microwave, Millimeter-, and Submillimeter-Waves

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System